Fact Sheet: Unique Atlantic Canyons Protected from Oil and Gas Activity

Today, the President designated 31 Atlantic canyons off limits to oil and gas exploration and development activity due to their critical and irreplaceable ecological value. The Atlantic canyons themselves, majestic geologic features carved by glacial runoff or by rivers that once flowed overland and were submerged by rising seas after the last ice age, have incredible ecological importance. The massive underwater canyons are home to many species and have been the subject of scientific exploration and discovery since the 1970s.

This action builds on the President's creation of the Northeast Canyons and Seamounts Marine National Monument, which protects 4,913 square miles of marine ecosystems located 130 miles southeast of Cape Cod. Today's action withdraws from oil and gas leasing, exploration, and development the remaining 31 major Atlantic canyons that are not already protected by the National Monument, ensuring these unique biological and geological resources will not be impacted by any future oil and gas activities in this area. The canyons are located in U.S. waters along the Atlantic continental shelf break running from Heezen Canyon offshore New England to Norfolk Canyon offshore the Chesapeake Bay. The withdrawn area totals 5,990 square miles (or 3.8 million acres).

Ocean temperatures in the Northeast U.S. are projected to increase three times faster than the global average, according to a study released earlier this year by the National Oceanic Atmospheric Administration (NOAA). Additionally, the first of several assessments to analyze the impacts of climate change on fish stocks and fishing-dependent communities found that warming oceans are threatening the majority of fish species in the region including salmon, lobster, and scallops. Today's designation will help safeguard the resilience of that unique ecosystem, ensure a refuge for at-risk species, and protect these natural laboratories for scientists to monitor and explore the impacts of climate change.

- Today's action recognizes the unique marine environment in the Atlantic and fishing's critical role in the region's economy and culture. Specifically, the withdrawal includes areas that support habitat important to commercial and recreational fisheries. The withdrawal does not impact ocean uses beyond mineral exploration and development.

The canyons are a defining characteristic of the Atlantic continental margin offshore the east coast of the United States. The canyons were formed when sea level was lower and rivers flowed to the margin of the continental shelf before the canyons were flooded by the sea when ice melted after the last glacial maximum some 25,000 years ago. The largest canyon is Hudson Canyon, which reaches depths in excess of 10,000 feet and is comparable in scale to the Grand Canyon, which is 6,093 feet at its deepest.

The canyons are widely recognized as hotspots of biodiversity, biologically unique, and ecologically and economically valuable for fisheries. The protected areas provide:

- Habitat for endemic and numerous other species, including deep-water corals, deep diving beaked whales, commercially valuable fishes, and significant numbers of habitat-forming soft and hard corals, sponges, and crabs;

- Important biological areas for many species of fish managed collectively in the Atlantic under the designation 'Highly Migratory Species', including numerous large, commercially valuable species such as marlin, sailfish, swordfish, tunas, and sharks; and
- Habitat for protected species such as sea turtles and marine mammals, including endangered sperm, fin, and sei whales and Kemp's ridley turtles.

Research demonstrates that the canyons provide valuable ecosystem services and economic benefits in addition to being places of refuge for species. Many of these species live many years, have low reproductive rates, grow slowly, and rely on the habitats provided by canyon features throughout their lifespans.

There are several examples of species or species groups that rely heavily upon canyon ecosystems. Marine mammal density data for a number of species clearly demonstrates an affinity with the continental shelf margin where the canyons are located. Species such as tuna and swordfish have been associated with canyons, particularly Hudson, Baltimore, and Norfolk Canyons. Golden tilefish, a large and long-lived species, occupies habitat in a relatively restricted band crossing the canyons. Norfolk Canyon is a Habitat Area of Particular Concern (a designation under the Magnuson-Stevens Fishery Conservation and Management Act) for this species. Deep-water and canyon ecosystems are also important to the deep-sea red crab at all stages of its life cycle.

A number of Atlantic canyon studies have been conducted on the region. One recent effort was undertaken by the Bureau of Ocean Energy Management (BOEM) and the U.S. Geological Survey (USGS), within the Department of the Interior (Interior), and the National Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce. Utilizing remotely operated vehicles (ROVs), substantial densities of deep-water corals were observed in both Norfolk and Baltimore Canyons. Some species were observed for the first time in these areas, including the important structure-forming species *Lophelia pertusa*.[1] Four other research efforts were conducted between 2012 and 2014, targeting nine mid-Atlantic canyons. The canyons investigated proved to be biodiversity hotspots, hosting many different species of coral, numerous fish species, several squids and octopus, and various sea stars, sea urchins, and sea cucumbers. These canyons were generally characterized by downslope areas of soft sediment leading up to steep walls with abundant biological communities under overhangs.

Some of the Atlantic canyon studies have shown that the diversity of habitat types creates a higher density of benthic species within canyons than at similar depths outside of canyons.[2] The presence of canyons can also influence fishery production by concentrating organic matter and enhancing local productivity, providing habitat and prey species, and concentrating species in a

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[1] Brooke, S., and Ross, S.W. 2014. First observations of the cold-water coral *Lophelia pertusa* in mid-Atlantic canyons of the USA. Deep-Sea Res. II. 104:245-251.

[2] Hecker, B., G. Blechschmidt and P. Gibson. 1980. Epifaunal Zonation and community structure in three mid- and north Atlantic canyons. Final report for the Canyon Assessment Study in the Mid-and North Atlantic Areas of the U.S. Outer Continental Shelf. Prepared for Bureau of Land Management, Department of the Interior. Contract BLM AA551-CT8-49. 139 pp + Appendices. Available from http://1.usa.gov/1JNwrHk.

NEFMC (New England Fishery Management Council). 2012. DRAFT Essential Fish Habitat (EFH) omnibus amendment. Deep-sea corals of the Northeast Region: Species, habitats and proposed coral zones, and vulnerability to fishing impacts. NEFMC: Newburyport, MA. Accessed 14 May 2015. Available from http://bit.ly/1d3vq3F.

Vetter, E.W., C.R. Smith, and F.C. De Leo. 2010. Hawaiian hotspots: Enhanced megafaunal abundance and diversity in submarine canyons on the oceanic islands of Hawaii. Marine Ecology 31:183-199. doi:10.1111/j.1439-0485.2009.00351.

discrete area.[3] Early studies, now confirmed by recent extensive work by BOEM and others, focused on the mid-Atlantic canyons and demonstrated that the canyons in this area can include unique biological communities associated with hard substrate exposed in and near the canyon features. These communities can include significant numbers of habitat-forming soft and hard corals, sponges, crabs, and fish species such as summer flounder, black sea bass, and tilefish.

Deep-water assemblages of hard (scleractinian) corals are a particularly significant community type in the deep-sea due to their ability to create complex habitat within the structure formed by the coral itself. Although significant colonies of well-known scleractinian corals such as *Lophelia* are rare within canyons, other corals including antipatharians (black corals) and gorgonians (e.g., sea fans) add significant community structure and potential for high community diversity. Studies world-wide have shown that cold-water corals support high biodiversity but are long-lived and slow-growing, making them susceptible to physical disturbance by human activities. Such studies have also highlighted the importance of cold-water corals as habitat for deep-water fishes, indicators of past ocean climate regimes, and sources of novel biological compounds. Deep-water corals, particularly gorgonians, have been observed in most all of the canyons where hard substrate is exposed.

The abundance and distribution of bottom fish species are different within and outside of canyons. Bottom fish are more abundant within the canyons compared to habitats at the same depth outside of canyon features. In addition, the species composition within canyons differs from that of open water habitats at the same depth. Canyons provide a more complex habitat and may serve to trap and concentrate prey species. Atlantic canyons are also important biological areas for many of fish managed collectively in the Atlantic under the designation 'Highly Migratory Species' (HMS) which include numerous large, commercially valuable species such as marlin, sailfish, swordfish, tunas, and sharks. These species and some other fishes are known to travel great distances to reach the canyons.[4]

Studies of individual canyons along the Atlantic coast of the U.S. and Canada have shown that certain species of marine mammals have a high affinity to canyon ecosystems. This is especially true for deep diving whales, including beaked whales and sperm whales.

In addition, and of great importance, the canyons are regions of enhanced biodiversity and play an important role in climate stability. The northwestern Atlantic is expected to be heavily

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[3] Yoklavich, M.M., H.G. Greene, G.M. Cailliet, D.E. Sullivan, R.N. Lea, and M.S. Love. 2000. Habitat associations of deep-water rockfishes in a submarine canyon: An example of a natural refuge. Fishery Bulletin 98:625-641.

Tudela, S., F. Sardá, F. Maynou, and M. Demestre. 2003. Influence of submarine canyons on the distribution of the deep-water shrimp, *Aristeus antennatus* (Risso, 1816) in the new Mediterranean. Crustaceana 76(2):217-225.

Brodeur, R.D. 2001. Habitat-specific distribution of Pacific ocean perch (*Sebastes alutus*) in Pribilof Canyon, Bering Sea. Continental Shelf Research 21:207-224.

Flexas, M.M., D.L. Boyer, M. Espino, J. Puigdefábregas, and A. Rubio. 2008. Circulation over a submarine canyon in the NW Mediterranean. Journal of Geophysical Research 113:C12002, doi: 10.1029/2006JC003998.

[4] NMFS. 2006. Final Consolidated Atlantic Highly Migratory Species Fishery Management Plan. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Highly Migratory Species Management Division, Silver Spring, MD. Public Document. pp. 1600.

NOAA FIsheries. 2016. DRAFT Amendment 10 to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan: Essential Fish Habitat and Environmental Assessment. NOAA Fisheries Office of Sustainable Fisheries Atlantic Highly Migratory Species Management Division. September 2016. Available online at http://www.nmfs.noaa.gov/sfa/hms/documents/fmp/am10/draft_maps/hms_efh_amendment_10_draft_ea_0648_xd990_final_090716.pdf.

Sedberry, G. and J. Loefer. 2001. Satellite telemetry tracking of swordfish, *Xiphias gladius*, off the eastern United States. Marine Biology 139(2): 355-360.

impacted by climate change. The canyons provide important shelf and slope habitat heterogeneity that could offer refuge for species potentially impacted by climate change.

Oil and gas activities have the potential to impact the seafloor wherever these activities occur. This includes discharge of oil, drilling muds, cuttings, and other debris that could affect seafloor habitats in the immediate vicinity of a well. Bottom disturbance associated with drilling, infrastructure emplacement, pipeline trenching, and removal of structures could also affect the seafloor. The withdrawal of these canyons from mineral leasing will help protect habitats, preserve critical ecological hot spots, conserve economically valuable fisheries, afford long-term opportunity for research and exploration, and help ensure that species dependent on the habitats of the canyons are protected.

The effect of a Presidential withdrawal is to indefinitely exclude the withdrawn area from leasing for mineral exploration and development. The President previously used this authority in December 2014 and January 2015 when he withdrew from leasing the Bristol Bay off of Alaska, home to world-class fisheries and stunning beauty, and certain areas of the Beaufort and Chukchi Seas because of their critical ecological and cultural values.

The Atlantic canyon region has a very limited oil and gas history, with no active leases since the mid-1990s and no production of oil and gas. The potential impact on hydrocarbon resources is estimated to be minimal. Oil and exploration and development would also be challenging due to technical and operational risks related to the canyon geology.